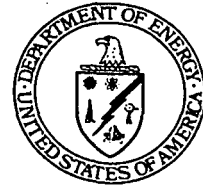




Department of Energy

Ohio Field Office
Fernald Area Office

P. O. Box 538705
Cincinnati, Ohio 45253-8705
(513) 648-3155



2299

JUN 16 1999

Mr. James A. Saric, Remedial Project Manager
U.S. Environmental Protection Agency
Region V-SRF-FJ
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

DOE-0850-99

Mr. Tom Schneider, Project Manager
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402-2911

Mr. Val Orr
Division of Drinking and Ground Waters - UIC Unit
P.O. Box 1049
1800 Watermark Drive
Columbus, Ohio 43216-1049

Dear Mr. Saric, Mr. Schneider, and Mr. Orr:

MARCH 1999 OPERATING REPORT FOR THE RE-INJECTION DEMONSTRATION

This correspondence submits the Re-Injection Demonstration Operation Report for the month of March 1999.

As specified in the Re-Injection Demonstration Test Plan, monthly operating reports for the re-injection demonstration are to be prepared and submitted to the U.S. Environmental Protection Agency (U.S. EPA), the Ohio Environmental Protection Agency (OEPA) Office of Federal Facilities Oversight, and the OEPA Division of Drinking and Ground Waters-UIC Unit.

000001

JUN 16 1999

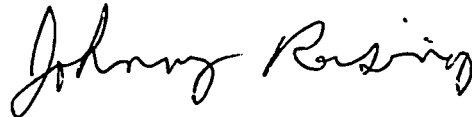
Mr. James A. Saric
Mr. Tom Schneider
Mr. Val Orr

-2-

2299

If you have any questions regarding this submittal please contact John Kappa at
(513) 648-3149.

Sincerely,



Johnny W. Reising
Fernald Remedial Action
Project Manager

FEMP:Kappa

Enclosure

cc w/enclosure:

J. Kappa, OH/FEMP
G. Jablonowski, USEPA-V, SRF-5J
R. Beaumier, TPSS/DERR, OEPA-Columbus
T. Schneider, OEPA-Dayton (three copies of enclosure)
F. Bell, ATSDR
M. Schupe, HSI GeoTrans
R. Vandegrift, ODH
F. Barker, Tetra Tech
D. Brettschneider, FDF/52-2
K. Broberg, FDF/52-5
D. Carr, FDF/52-2
W. Hertel, FDF/52-2
R. White, FDF/52-5
AR Coordinator, FDF/78

cc w/o enclosure:

N. Hallein, EM-42/CLOV
A. Tanner, OH/FEMP
T. Hagen, FDF/65-2
J. Harmon, FDF/90
R. Heck, FDF/2
S. Hinnefeld, FDF/31
T. Walsh, FDF/65-2
ECDC, FDF/52-7

000002

JUN 16 1999

-3-

2299

Mr. James A. Saric
Mr. Tom Schneider
Mr. Val Orr

bcc w/enclosure:
R. J. Janke, OH/FEMP

000003

MONTHLY OPERATING REPORT
RE-INJECTION DEMONSTRATION
MARCH 1999

2299

OVERVIEW

The FEMP Re-Injection Demonstration began on September 2, 1998. The controlling document for the Re-Injection Demonstration is the Re-Injection Demonstration Test Plan, Rev. 0. A requirement of Section 6 of the test plan is that monthly operating reports be submitted to the U.S. EPA, Ohio EPA Office of Federal Facilities Oversight, and the Division of Ohio EPA Drinking and Ground Waters-UIC Unit. The monthly operating reports are to include the following information:

- I. Analysis of the injectate
- II. The volume and rate of re-injection
- III. A description of any well maintenance and rehabilitation procedures which were conducted
- IV. Results of groundwater monitoring at the re-injection test site.

This report serves to fulfill this commitment for the month of March 1999. It covers operation of the Re-Injection Demonstration from March 1, 1999 through April 1, 1999.

ANALYSIS OF THE INJECTATE

Groundwater which is being extracted from the Great Miami Aquifer is being treated for uranium and re-injected back into the Great Miami Aquifer. The groundwater is being treated in the FEMP Advanced Waste Water Treatment (AWWT) Expansion Facility. The effluent from the AWWT Expansion Facility is being sampled monthly for the parameters listed in Table 2.1 of the Re-Injection Demonstration Test Plan, Rev. 0. Monthly injectate sampling is focusing on the final remediation level (FRL) constituents that have had an exceedance of their FRL in the area of the aquifer from which the groundwater is being pumped. The monthly injectate samples are being sent to an off-site laboratory for analysis.

The February report provided partial preliminary results for the injectate sample collected in February. The total uranium result was not provided. Complete preliminary results for the injectate sample collected in February, which include the total uranium result, are provided in Table 1 of this report. A review of radiological concentrations measured in the sample collected in February indicates that the concentrations are below their respective FRLs.

000004

Preliminary results from the injectate sample collected in March are provided in Table 2. A review of the preliminary data from March indicates that all of the constituent concentrations are below their respective FRLs.

VOLUME AND RATE OF RE-INJECTION

Treated groundwater is being re-injected into the Great Miami Aquifer in five re-injection wells at a rate of 200 gallons per minute per well. Figure 1 illustrates the location of the five re-injection wells. Re-Injection Well 8 is an 8-inch diameter well. Re-Injection Well 9 is a 12-inch diameter well. The other re-injection wells are all 16-inches in diameter. The combined design re-injection rate for all five wells is 1000 gallons per minute. Operational data specific to each re-injection well are provided in Tables 3 through 7.

Figure 2 illustrates the water level rise in each of the five re-injection wells from March 1, 1999 through April 1, 1999, as measured by the operators at the AWWT Expansion Facility Distributed Control System (DCS). Water levels are recorded three times per day. Water levels inside the re-injection wells are monitored as an indicator of plugging within the wells. As a well screen becomes plugged, the water level in the well rises to compensate for the greater pressure needed to maintain a constant re-injection rate.

While it is not the intent of this report to discuss operational efficiency issues, the following information is provided to aid in the interpretation of Figure 2. During the first few days of March, Re-Injection Well 8 was being rehabilitated. Operation of the well resumed on March 4, 1999 (Sample Number 553). Re-Injection Well 9 was not operating from March 8th to March 11th, (Sample Number 564 to 574), to facilitate repair to the downcomer. All of the re-injection wells were shut down from March 15th to March 16th (Sample Number 584 to 589), to facilitate a Y2K computer upgrade to the DCS system. Re-Injection Wells 8 and 9 experienced DCS communication problems from March 20th to March 26th (Sample Number 600 to 618) and March 20th to March 22nd (Sample Number 600 to 605), respectively.

WELL MAINTENANCE AND REHABILITATION

On February 26, 1999, Re-Injection Well 8 was shut down for rehabilitation. This is the second time that Re-Injection Well 8 has been rehabilitated to address plugging. The first rehabilitation took place

in late October after approximately two months of operation. The first rehabilitation was very successful. Following completion of the first rehabilitation, the water level rise in the well was 4.02 feet.

The latest rehabilitation of Well 8 lasted from February 26, 1999 to March 4, 1999. The well was rehabilitated using the same procedure that was used in October. Approximately 2.0 gallons of Sodium Hypochlorite were added to the well. The well screen was swabbed and surged and approximately 4,500 gallons of water were pumped from the well. The chlorine concentration of the water pumped from the well at the end of the rehabilitation was 0.03 ppm. Upon return to service on March 4, 1999, the water level rise in the well was approximately 7.48 feet. This is higher than it was following the first rehabilitation when the water level rise in the well was only 4.02 feet.

GROUNDWATER MONITORING RESULTS

Water quality samples for the Re-Injection demonstration are collected quarterly and analyzed for major anions, cations, and total uranium. The first round of water quality data was collected in August 1998, prior to the start of re-injection. Results of the August sampling event were reported in the September monthly report. The second round of water quality samples was collected in December 1998. Results of the December sampling event were reported in the January monthly report. The next scheduled collection of water quality samples for the re-injection demonstration took place in March 1999. Results will be reported in future monthly operating reports as they become available. At the end of the one year Re-Injection Demonstration, the water quality data collected quarterly during the demonstration will be used to illustrate water quality conditions over the course of the demonstration.

000006

TABLE 1
ANALYSIS OF INJECTATE PRELIMINARY RESULTS
Sample Collected February 17, 1999

Constituents ^a	Result ^b	Groundwater FRL ^c	Detection Limit	Constituent Type ^e	Basis for FRL ^f
General Chemistry		mg/L			
Nitrate	0.750 J	11.0		MP	B
Inorganics		mg/L			
Antimony	0.0002 B	0.006		N	A
Arsenic	0.0024 B	0.05		N	A
Barium	0.0609	2.0		N	A
Beryllium	0.00001 B	0.004		N	A
Cadmium	0.00019 B	0.014		N	B
Total Chromium	0.00074 B	0.022 ^d		MP	R
Cobalt	0.00029 B	0.17		N	R
Lead	0.00076 B	0.015		N	A
Manganese	.293	0.9		N	B
Mercury	U	0.002	0.00012	MP	A
Nickel	0.0022 B	0.1		N	A
Selenium	U	0.05	0.0013	N	A
Silver	U	0.05	0.001	N	A
Vanadium	U	0.038	0.0022	N	R
Zinc	0.0083 BE	0.021		N	B
Radionuclides		pCi/L			
Neptunium-237	U	1.0	0.0159	MP	R*
Radium-226	0.335	20.0		N	A
Strontium-90	U	8.0	0.362	MP	A
Thorium-228	U	4.0	0.124	N	R*
Thorium-232	U	1.2	0.0237	N	R*
Total Uranium	2.62	20.0		MP	A
Organics		µg/L			
Bis(2-ethylhexyl)phthalate	U	6.0	5	N	A
Carbon disulfide	U	5.5	5	N	A
1,1-Dichloroethene	U	7.0	1	N	A
1,2-Dichloroethane	U	5.0	1	MP	A
Trichloroethene	U	5.0	3	N	A

^aConstituents taken from Table 2-1 of Re-Injection Demonstration Test Plan. Constituents are those previously detected in aquifer zones 2 and 4 at concentrations above their FRL.

^bIf a duplicate sample was analyzed the highest concentration between the regular sample and duplicate sample is reported. B = Lab qualifier. Reported value was obtained from a reading that was less than the contract required detection limit but greater than or equal to the instrument detection limit.

E - Estimated because of suspected matrix interference as demonstrated by non-compliant serial dilution data for associated sample.

J = Lab qualifier, means data is estimated.

U = Nondetect

^cFrom Table 9-4 in OUS ROD.

^dFRL is for hexavalent chromium.

^eConstituent types from Appendix A of IEMP. MP indicates that the constituent has been identified as being able to migrate to the aquifer. N indicates that the constituent has been identified as not being able to migrate to the aquifer.

^fA - Applicable or relevant and appropriate requirement based (MCL, PMCL, etc.).

B - Based on 95th percentile background concentrations.

R - Risk-based

R* - Risk-based radionuclide cleanup levels include constituent specific 95th percentile background concentration.

000007

TABLE 2

ANALYSIS OF INJECTATE PRELIMINARY RESULTS
Sample Collected March 10, 1999

Constituents ^a	Result ^b	Groundwater FRL ^c	Detection Limit	Constituent Type ^e	Basis for FRL ^f
General Chemistry		mg/L			
Nitrate	0.69	11.0		MP	B
Inorganics		mg/L			
Antimony	0.001 B	0.006		N	A
Arsenic	0.00085 B	0.05		N	A
Barium	0.0514	2.0		N	A
Beryllium	U	0.004	0.00002	N	A
Cadmium	U	0.014	0.00010	N	B
Total Chromium	0.00071B	0.022 ^d		MP	R
Cobalt	U	0.17	0.00015	N	R
Lead	U	0.015	0.00045	N	A
Manganese	0.0045 B	0.9		N	B
Mercury	U	0.002	0.00010	MP	A
Nickel	0.00050 B	0.1		N	A
Selenium	U	0.05	0.00090	N	A
Silver	U	0.05	0.00022	N	A
Vanadium	U	0.038	0.00015	N	R
Zinc	0.0029 B	0.021		N	B
Radionuclides		pCi/L			
Neptunium-237	U	1.0	0.0164	MP	R*
Radium-226	0.419	20.0		N	A
Strontium-90	U	8.0	0.400	MP	A
Thorium-228	U	4.0	0.127	N	R*
Thorium-232	U	1.2	0.0513	N	R*
Total Uranium	2.44	20.0		MP	A
Organics		µg/L			
Bis(2-ethylhexyl)phthalate	0.6 J	6.0		N	A
Carbon disulfide	U	5.5	1	N	A
1,1-Dichloroethene	U	7.0	1	N	A
1,2-Dichloroethane	U	5.0	1	MP	A
Trichloroethene	U	5.0	1	N	A

^aConstituents taken from Table 2-1 of Re-Injection Demonstration Test Plan. Constituents are those previously detected in aquifer zones 2 and 4 at concentrations above their FRL.

^bIf a duplicate sample was analyzed the highest concentration between the regular sample and duplicate sample is reported. B = Lab qualifier. Reported value was obtained from a reading that was less than the contract required detection limit but greater than or equal to the instrument detection limit.

J = Lab qualifier, means data is estimated.

U = Nondetect

^cFrom Table 9-4 in OU5 ROD.

^dFRL is for hexavalent chromium.

^eConstituent types from Appendix A of IEMP. MP indicates that the constituent has been identified as being able to migrate to the aquifer. N indicates that the constituent has been identified as not being able to migrate to the aquifer.

^fA - Applicable or relevant and appropriate requirement based (MCL, PMCL, etc.).

B - Based on 95th percentile background concentrations.

R - Risk-based

R* - Risk-based radionuclide cleanup levels include constituent specific 95th percentile background concentration.

000008

TABLE 3

RE-INJECTION WELL 22107 (IW-8)
OPERATIONAL SUMMARY SHEET
MARCH 1999

Reference Elevation (feet AMSL) - 539.92 (top of casing)
Northing Coordinate ('83) - 476196.22
Easting Coordinate ('83) - 1347978.25

Hours in reporting period^a = 743.47
Hours not injecting^b = 148
Hours injecting^c = 595.47
Operational percent^d = 80.1

Target Injection Rate = 200 gpm

Monthly Measurements		
Month	Million Gallons Injected ^e	Average Operating Injection Rate (gpm) ^f
9/98	8.16	206
10/98	5.78	203
11/98	8.47	196
12/98	5.76	222
1/99	5.35	227
2/99	7.06	196
3/99	7.34	205

^aFirst operational shift reading on 03/01/99 to first operational shift reading on 04/01/99

^bDowntime. Well down during re-development. System was off due to planned power outages on site and Y2K upgrade of DCS.

^cHours in reporting period - Hours not injecting

^d(Hours injecting/Hours in reporting period) x 100

^eSummation of daily totalizer differences

^fMillion Gallons Injected/(Hours Injecting x 60)

000009

TABLE 4

**RE-INJECTION WELL 22108 (TW-9)
OPERATIONAL SUMMARY SHEET
MARCH 1999**

Reference Elevation (feet AMSL) - 578.025 (top of casing)
Northing Coordinate ('83) - 476255.74
Easting Coordinate ('83) - 1348384.49

Hours in reporting period^a = 742.38
Hours not injecting^b = 187.00
Hours injecting^c = 555.38
Operational percent^d = 74.8

Target Injection Rate = 150 gpm
200 gpm^e

Monthly Measurements		
Month	Million Gallons Injected ^e	Average Operating Injection Rate (gpm) ^f
9/98	8.17	206
10/98	8.30	201
11/98	8.53	197
12/98	5.66	214
01/99	4.33	181
02/99	6.07	156
03/99	5.93	178 ^g

^aFirst operational shift reading on 03/01/99 to first operational shift reading on 04/01/99

^bDowntime. Well off to fix large downcomer. System was off due to planned power outages on site and Y2K upgrade of DCS.

^cHours in reporting period - Hours not injecting

^d(Hours injecting/Hours in reporting period) x 100

^eSummation of daily totalizer differences

^fMillion Gallons Injected/(Hours Injecting x 60)

^gInjection out of smaller downcomer up until March 8th. Large downcomer was repaired and used from March 11th on. Target Injection rate of smaller downcomer is 150 gpm.

000010

TABLE 5

RE-INJECTION WELL 22109 (IW-10)
OPERATIONAL SUMMARY SHEET
MARCH 1999

Reference Elevation (feet AMSL) - 576.92 (top of casing)
Northing Coordinate ('83) - 476175.65
Easting Coordinate ('83) - 1348860.53

Hours in reporting period^a = 742.33
Hours not injecting^b = 77.00
Hours injecting^c = 665.33
Operational percent^d = 88.3

Target Injection Rate = 200 gpm

Monthly Measurements		
Month	Million Gallons Injected ^e	Average Operating Injection Rate (gpm) ^f
09/98	8.13	205
10/98	8.28	200
11/98	8.50	196
12/98	5.72	217
01/99	5.48	229
02/99	8.09	208
03/99	8.13	204

^aFirst operational shift reading on 03/01/99 to first operational shift reading on 04/01/99

^bDowntime. System was off due to planned power outages on site and Y2K upgrade of DCS.

^cHours in reporting period - Hours not injecting

^d(Hours injecting/Hours in reporting period) x 100

^eSummation of daily totalizer differences

^fMillion Gallons Injected/(Hours Injecting x 60)

000011

TABLE 6

**RE-INJECTION WELL 22240 (IW-11)
OPERATIONAL SUMMARY SHEET
MARCH 1999**

Reference Elevation (feet AMSL) - 577.14 (top of casing)
Northing Coordinate ('83) - 476422.82
Easting Coordinate ('83) - 1349386.92

Hours in reporting period^a = 742.57
Hours not injecting^b = 85.00
Hours injecting^c = 657.57
Operational percent^d = 88.6

Target Injection Rate = 200 gpm

Monthly Measurements		
Month	Million Gallons Injected ^e	Average Operating Injection Rate (gpm) ^f
0/98	8.39	211
10/98	8.29	199
11/98	8.50	197
12/98	5.68	216
01/99	5.53	230
02/99	8.06	208
03/99	8.04	204

^aFirst operational shift reading on 03/01/99 to first operational shift reading on 04/01/99

^bDowntime. System was off due to planned power outages on site and Y2K upgrade of DCS.

^cHours in reporting period - Hours not injecting

^d(Hours injecting/Hours in reporting period) x 100

^eSummation of daily totalizer differences

^fMillion Gallons Injected/(Hours Injecting x 60)

000012

TABLE 7

**RE-INJECTION WELL 22111 (IW-12)
OPERATIONAL SUMMARY SHEET
MARCH 1999**

Reference Elevation (feet AMSL) - 583.01 (top of casing)

Northing Coordinate ('83) - 476518.64

Easting Coordinate ('83) - 1350105.39

Hours in reporting period^a = 742.57

Target Injection Rate = 200 gpm

Hours not injecting^b = 76.00Hours injecting^c = 666.57Operational percent^d = 89.8

Monthly Measurements		
Month	Million Gallons Injected ^e	Average Operating Injection Rate (gpm) ^f
09/98	8.12	205
10/98	8.27	201
11/98	8.53	197
12/98	5.61	219
01/99	5.08	212
02/99	8.06	208
03/99	8.13	203

^aFirst operational shift reading on 03/01/99 to first operational shift reading on 04/01/99^bDowntime. System was off due to planned power outages on site and Y2K upgrade of DCS.^cHours in reporting period - Hours not injecting^d(Hours injecting/Hours in reporting period) x 100^eSummation of daily totalizer differences^fMillion Gallons Injected/(Hours Injecting x 60)

000013

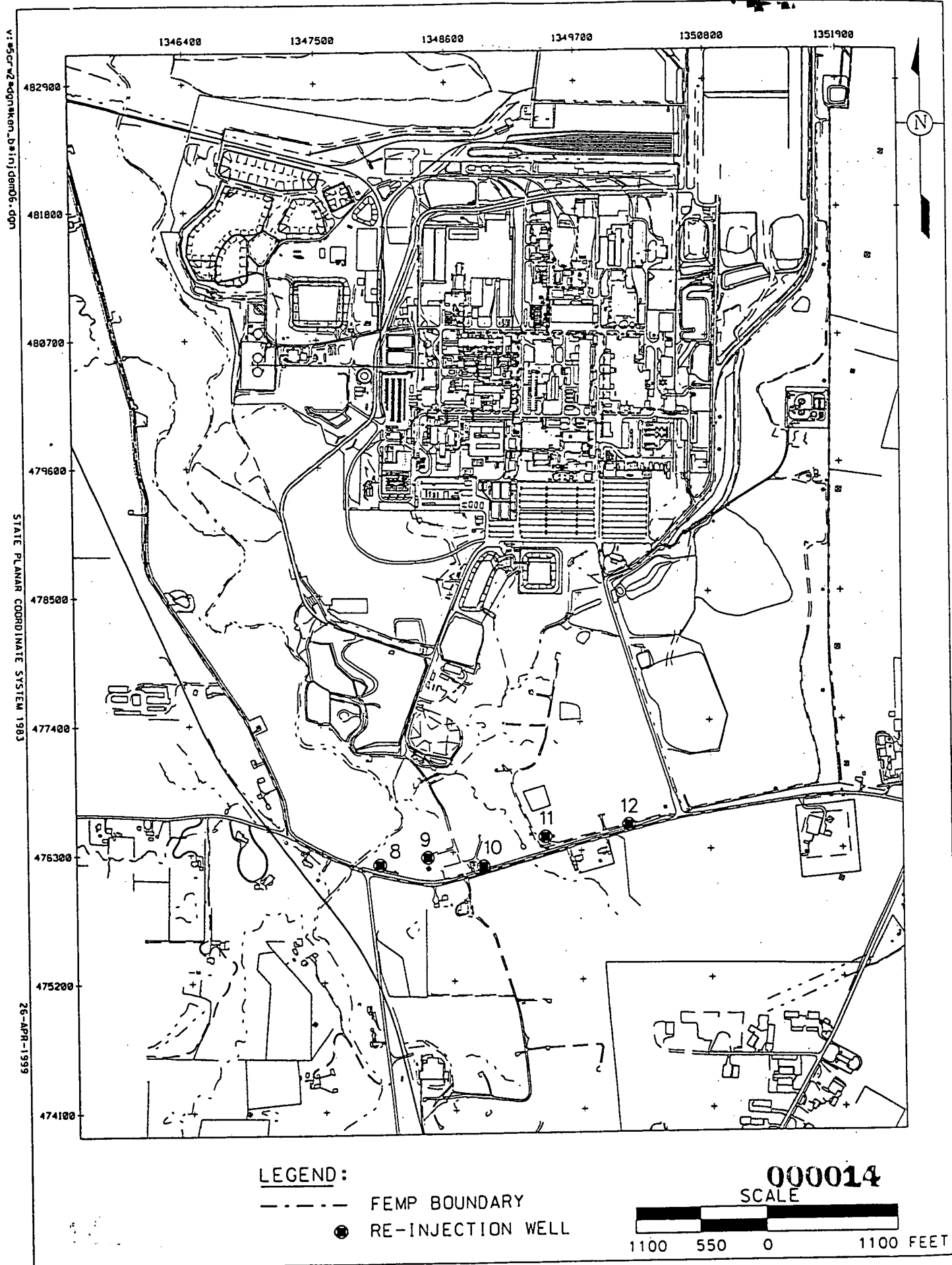
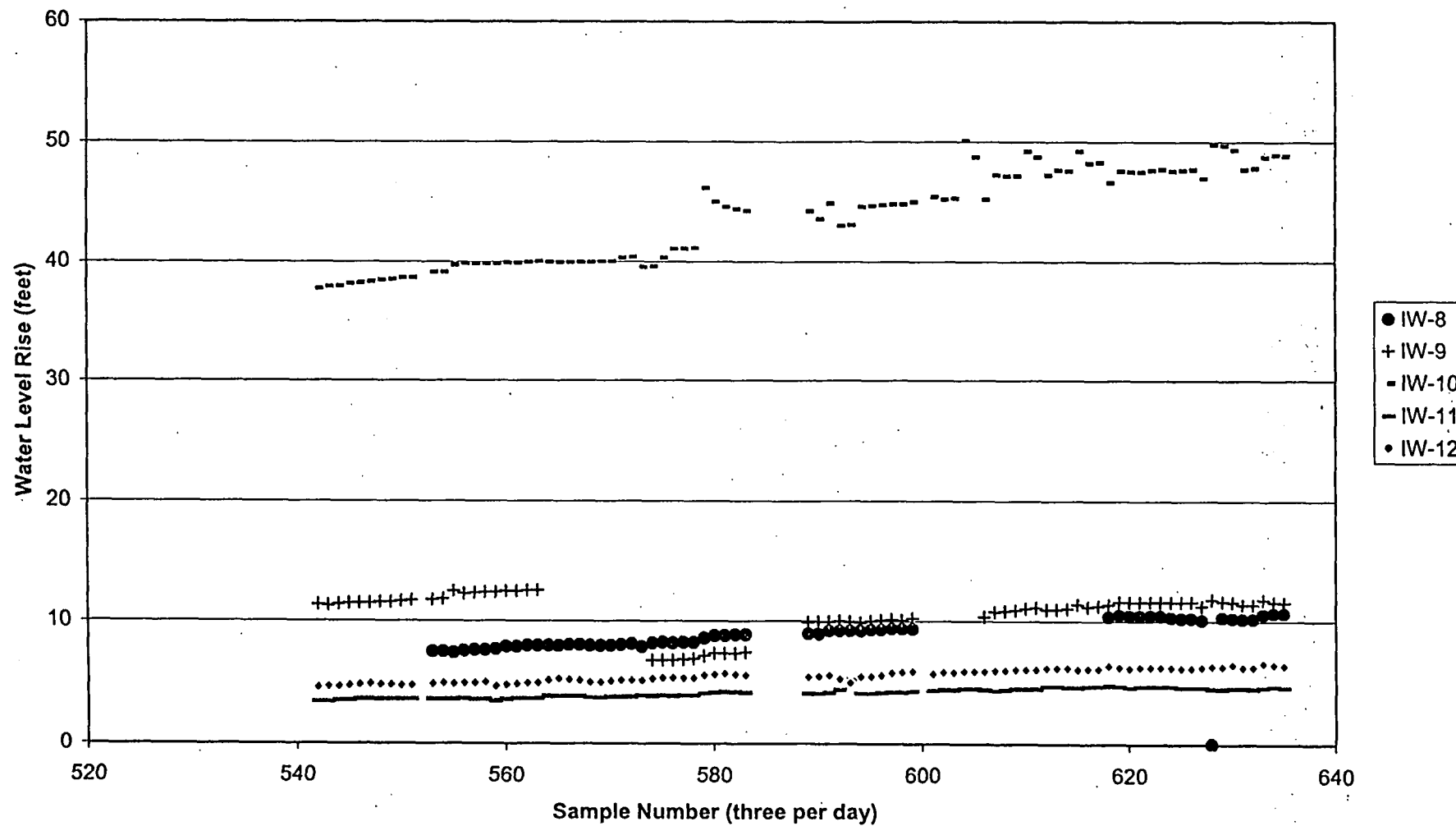


Figure 2
Re-Injection Wells, Water Level Rise
First Shift Mar. 01, 1999 to First Shift Apr. 01, 1999



000015